Internal gear honing
Hard-fine machining of components with internal gearing
Why does internal gearing have to be honed?

The importance of planetary gearboxes in automatic and particularly electric vehicles is continuously increasing. Higher torques despite space, weight and noise reduction at the same time make greater demands on the machining of all components in the planetary gearbox.

Heat treatment is necessary to optimise material strength values and load-bearing capacity of the gearing. Hardness distortion is produced and can only be compensated by subsequent hard-fine machining. To deal with this challenge, PRÄWEMA has developed internal gear honing ready for series production.

Internal gear honing

Turning, Power skiving, deburring

Heat treatment or nitriding

PRÄWEMA Antriebstechnik GmbH

In Eschwege in northern Hesse, PRÄWEMA Antriebstechnik GmbH produces and develops machines for machining and manufacturing gearing. The focus is on gear wheels, synchronous parts and shafts, which ensure the correct torque in vehicle gearboxes.

The milling of latching grooves, backing and gearing is just as much part of the PRÄWEMA technology portfolio as taper cutting and gear grinding.

PRÄWEMA developed gear honing technology until it was ready to enter the market competitively, resulting in more than 700 machines sold to date by the current market and technology leader.

All over the world, the automotive industry in particular relies on high-precision machine tools made by PRÄWEMA.

DVS TECHNOLOGY GROUP

The DVS TECHNOLOGY GROUP is made up of experienced machining companies focusing on the turning, gear cutting and grinding technologies. The DVS TECHNOLOGY GROUP has more than 1,000 employees worldwide and is one of the leading system suppliers for machines, tools and production solutions for the machining of vehicle powertrain components before and after hardening.

DVS Machine Tools & Automation: Manufactures and sells high-precision machine tools, automation equipment and the associated services.

DVS Tools & Components: Develops, manufactures and sells customised machine components, tools and abrasives.

DVS Production: Series production of components for passenger cars and commercial vehicles using DVS machine tools.

DVS International Sales & Service: Local DVS Contact for Sales and Service on International Markets.
THE TECHNOLOGY

The shaft angle ($\gamma$) and the rotary movement of the workpiece and tool axis create the necessary conditions for internal honing under axial movement of the workpiece.

The complete gearing is honed by means of oscillation combined with plunge feeding. This results in a considerably finer surface finish and a defined flank geometry of the internal gearing. The noise behaviour of the hollow wheel thus remains low despite high speeds.

THE MACHINE

PRAWEMA has further developed the machine platform SynchroForm for the technology of internal gear honing.

The extremely rigid machine bed made of natural granite is available in a single- and twin-spindle version. Depending on the version, either the output quantity can be increased or further upstream and downstream machining processes can be integrated.

Your advantage

- Significantly higher qualities for high-precision gearing with significantly larger contact area
- Optimised smooth running of the hollow wheel
- Ideal for gears with very high torque

Your advantage

- Extremely rigid machine bed for high-precision machining results
- Single- or twin-spindle version for higher output or further machining processes (e.g. outer diameter grinding)
THE TOOL

There are two different types of tool available for the technology of internal honing.

- Diamond-charged non-dressable tools
  The advantage of diamond-charged tools is that they do not have to be dressed, but they are more expensive to buy.

- Ceramic dressable tools
  Ceramic tools are dressed in the machine and thus more flexible. With the aid of the specially developed dresser VSDi, the gearing geometry of the honing wheel can be adapted to requirements.

THE DRESSING PROCESS

The VSDi dressing tools with internal gearing work with a diamond-coated cutting edge that has been generated in a defined process.

This cutting edge produces a homogeneous and extremely fast-cutting surface which is then used to achieve consistently high-quality machining results at the workpiece.
PRÄWEMA INTERNAL GEAR HONING

With original tool solutions and global technology support for PRÄWEMA gear honing, DVS TOOLING offers decisive added value for users. Individually designed tools for honing internal and external gears are just as much part of the portfolio as a wide range of dressing tools.

Visit [www.dvs-tooling.de](http://www.dvs-tooling.de) or write to [info@dvs-tooling.de](mailto:info@dvs-tooling.de) for more information.

PRÄWEMA enables maximum precision in one clamping by combining internal gear honing with upstream or downstream processes in one machine.

- BORE GRINDING
- O.D. GRINDING
- FACE GRINDING
AUTOMATION

There is a linear shuttle available for internal automation. This either moves the components from an external conveyor belt into the side of the machine or, with a twin-spindle machine, moves the components through the centre towards the rear where they can be transferred to an external automation unit.

This external automation unit can be customised. It goes without saying that robot solutions are possible as well.
Mitglieder der DVS TECHNOLOGY GROUP
Members of the DVS TECHNOLOGY GROUP

DVS MACHINE TOOLS & AUTOMATION

BUDERUS Schleiftechnik GmbH | www.buderus-schleiftechnik.de
Innenrundschleifen – Außenrundschleifen – Gewindeschleifen – Bohrungshonen – Hartdrehen
I.D. grinding – O.D. grinding – Thread grinding – Bore honing – Hard turning

DISKUS WERKE Schleiftechnik GmbH | www.diskus-werke.de
Planseiten-Schleifen – Doppel-Planseiten-Schleifen – Sonderbearbeitung
Face grinding – Double face grinding – Special machining

DVS Universal Grinding GmbH | www.dvs-universal-grinding.de
Kombinierte Hartfeinbearbeitung für Klein- und Mittelserien
Combined Hardfine Machining for small and medium size batches

PITTLER T&S GmbH | www.pittler.de
Vertikal-Drehbearbeitungszentren & Pick-up-Systeme – Verzahnungszentren
Vertical turning centers and Pick-up systems – Gear cutting centers

PRAEWEMA Antriebstechnik GmbH | www.praewema.de
Verzahnungshonen/-schleifen – Verzahnungsfräsen – Abspitzen/Hinterlegungsfräsen
Internal and External Gear honing – Gear grinding – Hobbing/Fly-cutting – Chamfering

WMS Werkzeugmaschinenbau Sinsheim GmbH | www.wms-sinsheim.de
Service-Dienstleistungen – Generalüberholungen – Reparatur von Baugruppen
Maintenance – Machine Retrofit – Repairs

WMZ Werkzeugmaschinenbau Ziegenhain GmbH | www.wmz-gmbh.de
Dreh- & Kombinationsbearbeitung wellenförmiger Bauteile – Motorspindeln
Turning & Combined machining of shafts – Motor spindles

DVS TOOLS & COMPONENTS

DVS TOOLING GmbH | www.dvs-tooling.de
Werkzeuglösungen und Technologiesupport für das PRAEWEMA Verzahnungshonen
Tool solutions and technology support for PRAEWEMA gear honing

NAXOS-DISKUS Schleifmittelwerke GmbH | www.naxos-diskus.de
Konventionelle Schleifwerkzeuge – CBN & Diamantwerkzeuge
Conventional grinding tools – CBN & Diamond tools

DVS PRODUCTION

DVS Production GmbH | www.dvs-production.de
DVS Technologien in der Serienfertigung für PKW-Komponenten
DVS Technologies in mass production for passenger car components

DVS Production South GmbH | www.dvs-production-south.de
DVS Technologien in der Serienfertigung für Nutzfahrzeug-Komponenten
DVS Technologies in mass production for commercial vehicle components

DVS INTERNATIONAL SALES & SERVICE

DVS Technology America, Inc. | www.dvs-technology.com
DVS Sales & Service in USA, Canada & Mexico

DVS Technology (Shenyang) Co., Ltd. | www.dvs-technology.com
DVS Sales & Service in China

DVS Technology Europe GmbH | www.dvs-technology.com
DVS Sales & Service in Europe

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